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# 2

## Assessing Experiential Entrepreneurship Education: Key Insights from Five Methods in Use at a Venture Creation Programme

Martin Lackéus and Karen Williams Middleton

### Introduction

Assessment is a key challenge in experiential education (Eyler 2009; Jarvis 2002). Variables such as student performance and satisfaction among students do not necessarily correlate with deep learning (Gosen and Washbush 2004; Molee et al. 2011). Expanding assessment from a focus on academic achievements to also take practice-based experiences into account is challenging for many educational institutions (Ferns and Moore 2012; Yorke 2011). A key reason is that learning from experience is a fundamentally complex phenomenon (Kayes 2002; Kolb 1984). Each individual learns in a unique way, specific to one's own learning style and preference. Learning is connected to the personal emotive associations driven by individual action and emotion and, at the same time, operates in a complex and interconnected context, driven by social

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M. Lackéus • K. Williams Middleton (✉)

Division of Entrepreneurship and Strategy, Department of Technology Management and Economics, Chalmers University of Technology, Gothenburg, Sweden  
e-mail: [karen.williams@chalmers.se](mailto:karen.williams@chalmers.se)

interaction. Thus, learning from experience is both individual and social, cognitive and emotive, structured and fluid. These characteristics of experiential learning and education pose some fundamental challenges to the important task of determining if students have learned in accordance with the teacher's intentions or not.

Entrepreneurship education relies significantly on experiential learning (Krueger 2009; Kuratko 2005; Neck et al. 2014). There is considerable consensus among entrepreneurship scholars that learning to become an entrepreneur requires an experiential approach (Cope 2005; Minniti and Bygrave 2001; Politis 2005). This has resulted in significant variation and experimentation both in experiential education approaches and in applied methods for assessment of learning outcomes. While a majority of entrepreneurship courses and programmes still apply a traditional teaching approach (Pittaway and Edwards 2012), many faculty groups have been extensively engaged in developing experiential education. One extreme case of experiential entrepreneurship education utilizes a venture creation approach (Ollila and Williams Middleton 2011), in which entrepreneurship education is integrated with university-based business incubation. Programmes utilizing this approach have been defined as venture creation programmes (VCPs), where the creation of a real-life venture is the primary vessel for learning (Lackéus and Williams Middleton 2015). The authenticity and real-life consequences of creating a new venture as part of a VCP contribute to triggering an emotional roller-coaster for students, often resulting in strong development of their entrepreneurial competencies (Barr et al. 2009; Lackéus 2013; Meyer et al. 2011; Thursby et al. 2009).

While previous work has outlined many general characteristics of VCPs in considerable detail (for some recent examples, see Adams 2016; Bozward and Rogers-Draycott 2017; Lockyer and Adams 2014; Morland and Thompson 2016), this chapter focuses specifically on assessment practices of VCPs. If a VCP constitutes one of the most extreme forms of experiential entrepreneurship education, it should be possible to gain new insights about assessment of experiential education from studying assessment practices at VCPs more in-depth. The purpose of this chapter is therefore to explore the following question: What can be learned about experiential education assessment in general from the specific case of a well-developed and mature VCP?

The chapter proceeds as follows. First, a literature review is conducted on assessment methods in general and on assessment practices in entrepreneurship education. A resulting set of five assessment methods are then applied to the specialized VCP case, after a short description and qualification of the VCP case is presented. Findings from the VCP case are summarized along the five assessment methods and then analysed through a discussion of some key emerging themes. The chapter concludes with implications and suggestions for future research.

## Literature Review

### Five Approaches for Assessing Experiential Education

While assessment of students is a key challenge for experiential educators, there are nevertheless a few different approaches that have been discussed by experiential education scholars (McNamara 2013; Roberts 2015). This section summarizes five such assessment approaches: performance assessment, reflective assessment, peer/self-assessment, e-assessment and constructive alignment. An overview is provided in Table 2.1. Many of these five approaches belong to the overarching category of formative assessment, defined as assessment with a purpose of improving the learning process (Black and Wiliam 1998). Formative assessment has been claimed to be particularly relevant to experiential education (Roberts 2015). It produces various kinds of feedback information that can be used to improve an ongoing learning process, either through actions taken by teachers or by students themselves. This can be contrasted to summative assessment, defined as assessment with a purpose of awarding certificates, diplomas and degrees that can be used for later stages of education and for work-life qualification (Isaacs et al. 2013). Summative assessment is common in traditional education (Ferns and Comfort 2014).

### Performance Assessment

Performance assessment is about letting students perform meaningful and hands-on real-life tasks and assess them based on their task accomplishment (Isaacs et al. 2013). It requires students to perform a task

**Table 2.1** A brief summary of five different assessment methods

Type	Description	Benefits	Challenges
Performance assessment	Accomplishment of real-life tasks	Active Promotes critical thinking Problem solving	Time consuming Subjective
Reflective assessment	Reflections upon own learning experience	Easy to get students started Meta-cognition focus	Non-standardizable Requires teacher reaction/feedback Difficult to reach depth of reflection
Peer and self-assessment	Student-driven assessment of self and others	Student perspective Student takes responsibility for own and others' learning	Validity/reliability Requires training and faculty feedback and/or guidance
E-assessment	Computer-assisted assessment	Saves teachers' time Versatile	Risk for surface learning Cost of technology
Constructive alignment	Assessment aligned with critical learning activities	Bridges gap between theory and practice	Requires careful planning

where they demonstrate their knowledge and skills. Teachers can assess both the behavioural process itself and any resulting artefacts produced by the students. Although simulations are common, it is preferable that tasks are done in authentic settings, mirroring or even representing 'real-world' performance (Biggs and Tang 2011). The benefits of performance assessment are particularly evident when assessing more complex and higher-order skills (Darling-Hammond 1994). It has also been shown to engage and motivate students and foster critical thinking and problem solving. Performance assessment is common in arts (e.g. dance, music, acting) and vocational education (e.g. vehicle repair, hairdressing). While more inclusive than written examination, performance assessment can be difficult to design and deploy, often requiring substantial investment of time in the assessment process and open to subjectivity and lack of clear distinction between different levels of achievement.

## Reflective Assessment

Reflective assessment empowers students to be central to their own learning by having students reflect individually or in groups upon their own learning experience (Bond et al. 2011; Ellis 2001; Gibbs 1988). Reflections can be done quite easily in written or oral formats. This serves the fundamental purpose of improving learning, thus positioning it as a formative means of assessment. The learning process is captured through step-by-step self-evaluation of what was experienced, including description of what happened, what was thought/felt, what was positive or negative, what can be interpreted from the situation, what was missing and what would be done differently if met with the same situation (Gibbs 1988). Reflection fosters meta-cognition of a situation with tacit association to what occurred translated into higher-level understanding. However, reflection can result in a large conglomeration of information to assess, which can be both time consuming and place requirements on the educator to qualify reflections through additional questioning or feedback. It is also difficult to reach a reflective depth in the content of students' reflections (Moon 2004).

## Peer and Self-Assessment

Peer assessment involves students assessing one another in terms of knowledge, skills and/or performance (Dochy et al. 1999). The assessment can be qualitative or consist of marking each other, which may or may not be criteria based. Peer assessment is strongly linked to self-assessment, which is the involvement of students in judging their own achievement and learning. Peer assessment often informs self-assessment, since assessing others has been shown to increase awareness of and engagement in own performance and learning relative to standards and learning goals (Isaacs et al. 2013). Peer and self-assessment can thus serve not only as a means of assessing students but also as a path towards improved learning and academic performance. A challenge in applying

peer assessment is that it is difficult to provide constructive feedback, requiring specific student training in how to assess others and nurturing of a trustful culture in the class (Isaacs et al. 2013).

## **E-Assessment**

E-assessment involves the use of computers to support assessment (Stödberg 2012), ranging from simple computer-based tests with multiple-choice questions to complex and multimedia-rich simulations, games, case studies and e-portfolios. It is the corresponding assessment phenomenon to e-learning, that is, the practice of computer-supported learning. E-assessment can be used both for high-stakes and for low-stakes testing, as well as both for summative and formative assessment (Boyle and Hutchison 2009). Common topics in e-assessment include distribution and collection of responses as well as construction and marking of questions and tasks. E-assessment can free time for teachers that they otherwise would have needed to spend on administrative tasks associated to assessing students. As many of the less complex forms of e-assessment rely on simple right-or-wrong questions, e-assessment has often been accused promoting an outdated model of surface learning, focusing solely on recall of simple facts (Jordan and Mitchell 2009).

## **Constructive Alignment**

Constructive alignment is a principle stating that teachers should align what the students need to do in order to learn with what is being assessed (Biggs and Tang 2011). Since students construct meaning through the learning activities they undertake, any assessment should therefore align with these activities so that the activities students are supposed to learn from are the very ones being assessed. Constructive alignment bridges the gap between declarative knowledge and personal experience by requiring all students to go through those experiences that are necessary to acquire the intended learning outcomes (Biggs and Tang 2011, p. 7 and p. 97). The approach can require teachers to modify their thinking

around teaching and, in particular, regarding defining levels of understanding. Increased clarity is often needed in terms of what students need to do in order to reach different levels of understanding. The initial stage of establishing an aligned system requires careful consideration and possible redesign of curriculum. This can be a challenge in academic settings where planning time is often a scarce resource.

## Assessment in Entrepreneurship Education

There are at least four main focus areas of assessment in entrepreneurship education. First, scholars have tried to assess whether or not entrepreneurship education ‘works’ in terms of leading to desirable outcomes such as student learning and new business creation (Martin et al. 2013). This kind of scholarly assessment aims to find answers to a long-standing question: ‘Can entrepreneurship be taught?’ (Henry et al. 2005a, b). Second, teachers and students have placed high value on assessment of institutional capability to teach entrepreneurship (Finkle and Deeds 2001). A number of ranking systems have been provided to cater for this interest through business media outlets such as Entrepreneur Magazine, BusinessWeek and Fortune Magazine (Streeter et al. 2011). Third, a few attempts have been made to assess individual teachers on their ability to teach entrepreneurship (Bacigalupo et al. 2016; Ruskovaara and Pihkala 2016). This is more of a formative assessment approach, letting teachers assess themselves and their institutional context in order to identify potential areas for improvement (Henry 2015; Ruskovaara et al. 2015). Fourth, a wide variety of tools, methods and approaches are available for the assessment of students in entrepreneurship education (Pittaway and Edwards 2012; Pittaway et al. 2009). Since student assessment is a key focus of this chapter, it will be discussed more in-depth.

A recent empirical study by Pittaway and Edwards (2012) showed that the most common assessment method in entrepreneurship education was to let students write a business plan. Other common assessment methods were oral presentations, mandatory classes, tests, exams, essays and case studies. Less common methods included reflective assessment, peer assessment and interviews. The assessment approach applied depended



largely on which kind of pedagogical approach the teachers had opted for. More traditional courses and programmes emphasizing knowledge acquisition and learning 'about' entrepreneurship employed primarily summative and objective assessment methods, such as tests and exams. More experiential courses emphasizing development of an entrepreneurial mindset by learning 'through' entrepreneurship employed a much higher share of formative and subjective assessment methods, such as reflection and essay writing. Pittaway and Edwards (2012) concluded that apart from a few innovative cases, most assessment approaches opted for in entrepreneurship education were quite traditional, emulating other subject areas. This illustrates the need to study extreme cases of particularly innovative and highly experiential entrepreneurship education programmes if the aim is to generate insights of broader relevance to experiential education assessment.

Very few scholars in entrepreneurship education have related explicitly to any of the five assessment methods for experiential education discussed in the literature review above. Some limited examples will nevertheless be given. Haines (1988) discussed performance assessment in relation to a venture creation programme in terms of assessing students on the number of customers they acquired and the level of profitability of their consulting business. Lans et al. (2015) proposed performance assessment in entrepreneurship education to be based on ability to generate and evaluate new business ideas. Deacon and Harris (2011) found that a blended/reflective pedagogic approach to entrepreneurship education developed a wider range of skills within participants, including shaping their perspective on opportunity. Blenker et al. (2012) stressed the importance of reflective assessment to help tailor entrepreneurship education to be personalized to each individual learner. Pittaway and Edwards (2012) concluded that reflective assessment was rare except for in the most experiential courses and programmes and that there is need to not only include more reflective assessment but also understand how external stakeholders engaged in assessment affect student learning. Human et al. (2005) discussed the use of e-assessment to help students self-assess their entrepreneurial characteristics in order to direct development of specific entrepreneurial skills. Jones and English (2004) described the critical role of peer assessment in shifting to entrepreneurship education which is

student-centric. Peer assessment was used to monitor and reward individual and group performance. Finally, Jones (2006) called for the use of constructive alignment to associate tasks to learning in order for students to assess how well suited they were for entrepreneurial processes.

## Method

### Research Approach and Design

Case studies constitute rich descriptions of specific instances of a phenomenon, often stemming from a variety of empirical sources (Yin 2008). A case enables research development which is situated and allows for pattern and relationship recognition among and across constructs, as well as provision of underlying argumentation and reasoning (Eisenhardt and Graebner 2007). This chapter utilizes an extreme case selection strategy to facilitate rare insight into a ‘clinical’ laboratory environment (Schein 1993). The selected VCP spans two decades and the authors have been embedded in the programme in multiple roles, giving access to insights inaccessible to participant observers.

The contextual complexity of the extreme case allows for triangulation of insights from different perspectives and longitudinally across multiple iterative cycles of process—most notably for this chapter, the final year of the master programme where education is embedded in venture incubation (and vice versa). Extreme cases are chosen due to their uniqueness, as they can provide unusual revelation, extreme exemplars and opportunities for unusual research access (Yin 2008). The aim of using this approach is to provide analysis of educational assessment mechanisms based on rich empirical data having both contextual and longitudinal detail including underlying logic and design description from actors involved in all aspects of the education, including not only delivery and assessment, but legitimacy and design.

Analytical design builds upon the set of five assessment methods presented in the previous section. These qualified assessment methods are investigated in the unique case. Analysis stems from access to programme documentation, in terms of not only course and content description but

also programme design documentation and insights. Interviews are conducted with programme responsible staff, to further insight into contextual details influencing choice of pedagogy and assessment and to access reflection upon applicability and adaptation of various choices, as well as description of critical incidents which shaped key decision points.

## The Case Studied

The empirical base of this chapter is the two-year international MSc programme in Entrepreneurship and Business Design at Chalmers School of Entrepreneurship (CSE). Situated at Chalmers University of Technology, itself recognized as an entrepreneurial university (McQueen and Wallmark 1982), this nationally renowned programme combines entrepreneurial education and incubation to facilitate a learning through approach (Lackéus and Williams Middleton 2015; Lundqvist and Williams Middleton 2008; Williams Middleton and Donnellon 2014). The CSE programme was top-ranked by the Swedish government in 2009 using an international review board of entrepreneurship education professors, and the collaborating incubator was ranked number eight in the world and second in Europe in 2014 by UBI Index. Its status as an extreme case of experiential entrepreneurship education has attracted a number of external scholars studying many different aspects of the programme (Åstebro et al. 2012; Berggren 2011; Johannisson 2016; Lindholm Dahlstrand and Berggren 2010; Rasmussen et al. 2006; Rasmussen and Sørheim 2006; Warhuus and Basaiawmoit 2014).

CSE represents an innovative technology transfer mechanism at Chalmers. Its inception was based upon an analysis that a key scarce resource was entrepreneurial individuals, rather than a lack of promising ideas or other resources. Because of this, CSE has a specialized admissions programme which emphasizes the importance of commitment and motivation for a dual learning and apprenticeship process. Student cohorts are multidisciplinary, with backgrounds primarily from technology or business, with a minority of admitted students holding design, legal and/or bio-science competence. Students are typically between 24 and 28 years of age.

The first year of the education is focused on creating a robust foundation for the second year of highly action-based pedagogy. Students are

introduced to concepts and tools around intellectual property, innovation, technology markets and entrepreneurship. They apply them to a shelved idea based on patented technology platforms. Intellectual property assessment, concept design, techno-economic analysis, shareholder agreements, business models and business plans are developed around the idea in order to simulate early stage venture creation. In the second semester, students take elective courses, including an idea evaluation course. In this course, students act as creative consultancy teams towards inventors and their early stage inventions. They apply design and evaluation tools to determine different types of utility for inventions. Application is on real-world ideas, but for a limited time frame, such that actions are prescribed for the inventors instead of enacted by the students themselves.

The second year of the education embeds the students in an in-curricular real-life venture creation environment (Ollila and Williams Middleton 2011). Students are formed into teams of two or three and matched with a technology-based idea often based on a patent or something patentable. Students are placed in the 'driver's seat' of the nascent venture, tasked to incubate and ultimately either incorporate or recycle back to the idea partner. Failure is accepted and encouraged if the idea should prove inviable. The venture is then terminated and a new idea is taken on. Venture ideas are sourced through the collaborating incubator Chalmers Ventures, a Chalmers subsidiary responsible for technology transfer, incubation and seed financing. The venture creation process functions as an in-curricular learning platform. Learning is captured through a 60-credit master thesis where students compile studies applied to the venture process regarding entrepreneurial decision making, product development, market verification, customer development, and business strategy and execution. Students are supported by a network of stakeholders and shareholders.

### **Critical Underlying Principle of the CSE Case: Creating Value for Others**

From its start in 1997 to 2017, more than 80 venture projects from CSE have been incorporated, with 80% survival rate. These 80 companies had a total annual turnover in 2016 exceeding 40 million Euros and employing

around 400 people (Lackéus et al. 2016). More than 450 students have also received an education based on learning *through* venture creation, leading to strong development of entrepreneurial competencies applicable not only in the immediate incorporated ventures but also in independently started ventures, in corporate settings and in public offices. The dual process of value creation and learning represents a critical underlying principle of CSE: ‘students-as-givers’ that are ‘learning-through-creating-value-for-others’ (Lackéus 2017b; Lackéus et al. 2016). Students at CSE are thus expected to learn by applying their competencies to create something novel of value to external stakeholders outside their university. The venture that students are expected to start at CSE is, however, merely a vessel for creation of new kinds of value. It is through the essential experience of new value creation, in the vessel of a venture, that the learning of entrepreneurial competencies is achieved. The fundamental objective of the programme is, and has always been, learning of entrepreneurial competencies. This critical underlying value creation principle at CSE is outlined briefly here since it has key implications for assessment.

## Findings

As discussed in the introduction, learning is a complex and comprehensive phenomenon. Education designed to embed the learner in the entrepreneurial experience naturally incorporates multiple forms of learning and thus requires multiple means of assessment. The following sections revisit the five assessment methods from the literature review and describe in-depth how they are used at the special empirical VCP case of CSE.

## Performance Assessment at CSE

CSE, as a VCP, is fully based on students learning by starting an authentic venture involving engagement with real customers and significant investment of real money. Because of this, CSE is fully aligned to most of the performance assessment characteristics outlined in the literature review section. The opportunity for students to perform in a real-life

entrepreneurial ecosystem has been shown to trigger high levels of engagement and student motivation. It also allows teachers to follow the students as they demonstrate higher-order critical thinking and problem solving. But as venture creation often leads to failure, a key difference in performance assessment at CSE is that teachers are not assessing students on the quality of the resulting venture in terms of profitability, money raised or customers attracted. Performance assessment is instead focused on awareness, development and enactment of key activities in the process leading up to eventual success, stagnation or failure of the venture. Writing a business plan used to be regarded as one of these key activities but has recently been deemed obsolete, as business plans often represented descriptive promises rather than communicating and substantiating reasoning for critical decision making constituting business execution.

CSE manages the common assessment challenge of distinguishing between different levels of student achievement by outsourcing the responsibility for such judgements to non-faculty stakeholders in the entrepreneurial ecosystem. Students are constantly being summatively assessed by business coaches, expert panels, venture competition judges, investors, industry experts, potential customers and peer entrepreneurs, both within and outside the class. Students are also required to design their own assessment process by staging and performing all the necessary tests and experiments needed to critically evaluate their business hypotheses. Faculty have the role of conducting meta-assessment of performance, that is, assessing the students' ability to assess their own venture creation process. This entails judging how the students reason, analyse, justify and communicate their venture creation process and product in writing and orally. Students navigate critical milestones through oral presentations designed into the venturing process. Students first present to each other, then to an internal friendly audience and finally to a critical external audience. Repeated coaching sessions let students develop and hone verbal, visual, content and bodily communication.

The guiding principle of performance assessment at CSE is that faculty provides primarily formative assessment and that external stakeholders provide primarily summative assessment. Summative assessment is presented in the form of awards, oral judgements and a resulting reputation

within the class. In the second year, grading scales are not used, allowing faculty to focus on formative assessment. Students are instead given pass or fail, and incentives to over-perform come from a culture of being judged summatively by stakeholders in the entrepreneurial ecosystem. A critical drawback of such outsourced assessment, requiring faculty attention, is the level of stress some students take upon themselves, due to an inability to monitor their own work-balance levels and regulate perfectionism tendencies.

## **Reflective Assessment at CSE**

Reflective development talks with students and faculty have been a key part of CSE since its inception in 1997. Each student is required to attend at least four group development talks and two individual development talks during the venture creation process of the second year. All talks are facilitated by a faculty member. The main purpose is to stimulate reflective discussion, where faculty and students together can sense-make the entrepreneurial journey taking place. Attending these talks is not ‘visiting the psychiatrist’ or ‘reporting to faculty’. The talks are a space for reflection, with content ‘governed’ by the students, including discretionary choice of what is disclosed. They are facilitated by the faculty in such a way as to build and maintain trust, both between the faculty member and the students and across the students. A balancing act is required between letting students bring up critique without consequences and faculty taking action if critical issues surface. Importantly, all persons involved hold responsibility for the quality and sincerity of the discussion.

Development talks at CSE serve as a space for asking questions that shift students’ perspective, triggering them to look inwardly. Students are often not able to directly answer questions asked, necessitating further reflection between talks, and thus shifting their mindset from only doing to also including critical reasoning. The talks also provide a space free from the usual performance requirements, the only expectation instead being that they think about and sense-make what has happened to them. At times, the talks serve as a space for students to project or

release frustrations, in order to detach failure or disappointments from themselves, so that they can then manage their emotional reaction to failure. It is often critical that the dialogue be supported without the facilitator taking responsibility for externally triggered unforeseen contingencies. This is in order to recognize the reality of the entrepreneurial process as generating the emotional roller-coaster experienced and help the students learn how to manage the multiple contextual factors that come with being embedded in a venture. Frustration is acknowledged and then constructively mirrored back to the students when suitable and within their area of responsibility. This leverages deep reflection, since negative experiences often represent critical and potentially transformative events that students can learn from (Jarvis 2006; Mezirow 1991). The development talks can also help detect if students are suffering from the sheer authenticity of the programme, for example, serving as an early warning system for dysfunctional behaviour, unhealthy stress levels or unrealistic expectations.

Students are also required to deliver several written reflections. Exams and reports frequently include questions and sections where students are expected to reflect upon how they used theory in practice and whether it was appropriate or not in their specific context. CSE has also applied several different setups for reflective diaries, though this has been challenging from a faculty workload perspective. A recent remedy to this has been to implement a digital tool facilitating task-based reflection, as explained in detail in the findings section.

## **Peer and Self-Assessment at CSE**

The strongest peer assessment characteristic at CSE is the informal effect of students having access to a physical office in the second year. Each venture team gets 15 square meters of office space as a base for daily operations. Working with the same team for a full academic year in such a small cubicle creates a continuous intra-team peer assessment process. The proximity to other teams also creates a 'pressure cooker' culture of comparison and competition between teams. Students generate subjective and often unspoken judgement of what 'good' performance is.



Individuals and teams select which of their peers they want to learn the most from and be inspired by. Being constantly exposed to peer assessment can also result in constant cycles of self-assessment, where students frequently ask themselves ‘Am I good enough?’, which can have both constructive and destructive consequences.

In addition to informal peer and self-assessment, there are also a number of formal mechanisms in place. The team composition process in the first year contains a mandatory written peer assessment task where each student is required to assess the perceived qualities of each of their classmates. Here students are required to justify why they think any given classmate is complementary in relation to their own strengths and weaknesses in regard to venture creation. This triggers student self-insight and social awareness and also facilitates faculty decisions on team composition. The second year also contains a number of oral presentations to the class, where each group is responsible for giving constructive feedback to another group’s presentation. The students are also asked to give out awards for ‘best team’, where some key criteria are being open to feedback, supporting the rest of the class and focusing on learning the most from the CSE experience.

## **E-Assessment at CSE**

A number of common digital tools are in use at CSE. A digital learning management system (Ping Pong) is used for receiving, managing and approving written assignments, including automatic plagiarism checks. Video platforms such as YouTube are also used for ‘flipped classroom’ lectures, that is, lectures that students can watch at home or at their office when it suits them. There is also an e-assessment tool in use at CSE that is not part of the standard e-assessment toolbox. A unique and innovative e-assessment tool called ‘LoopMe’ has been developed through a research project at CSE focused on the role emotional events play for students developing their entrepreneurial competencies (Lackéus 2016). LoopMe is a digital and mobile social media platform that allows for simple and relevant one-to-one dialogues between a small team of teachers and many students. It revolves around mandatory action-oriented tasks that a

teacher defines and that students then perform, react emotionally to and reflect upon. LoopMe has been stated to represent a new category of e-assessment tools labelled 'social learning media', that is, social media optimized for social learning (Lackéus 2017a).

CSE faculty have used the LoopMe tool to design action-based learning experiences by breaking the learning process down into around 20 manageable tasks for each semester. Mandatory tasks include making cold calls to potential customers, meeting potential customers, developing team trust, testing venture hypotheses, reflecting on critical emotional events and sharing insights with other teams in the class. Specifying what students are required to do in this way clarifies goals, prompts students to take action and forces students to reflect afterward upon emotions and learnings associated to each task. It also simplifies the process of giving prompt feedback to students in real time as key learning events occur. This has facilitated a more structured formative assessment of a large number of activities that are known to lead to entrepreneurial competence development and venture performance. It has strengthened the relationship between faculty and students, without causing an uncontrollable abundance of information for faculty members. It has also provided a clear structure and support to students around reflections. As the critical incidents and emotions are captured digitally together with personal reflections produced in the moment, they can also be utilized for individual, peer-to-peer and even class-wide discussions around comparable or replicated experiences, facilitating multiple loops of learning.

## **Constructive Alignment at CSE**

CSE is designed around a mandatory real-life venture creation process, with an intention to incorporate the venture if it becomes successful. This makes CSE constructively aligned on the highest level of analysis, based on a view that creating a venture is what students need to do in order to become more entrepreneurial. On a more fine-grained level of analysis, CSE faculty have undertaken significant programme development work in order to secure constructive alignment. Learning outcomes have been specified primarily in action-oriented terms to reflect a conviction that

students learn entrepreneurship primarily by enacting a role as entrepreneur. Four areas of key competence have been articulated at CSE. Mandatory activities are specified in each area that are considered to contribute to the development of each competence. Activities in these four areas will now be briefly exemplified.

To assess competencies related to business strategy and execution, students at CSE are required to work with a deep technology venture idea during nine months, incubating it to a point of validation or termination. Mandatory milestones include securing intellectual property rights over the idea, setting up and continuously reporting to a governing board, validating technology and market assumptions, securing necessary financial resources and presenting to the stakeholder community. To assess competencies related to entrepreneurial mindset and teamwork, students are required to constantly work and deliver in a team for extended time periods and participate in individual and group development talks as well as other kinds of peer and self-assessment. They are also required to collaborate successfully with the provider of the technology-based venture idea and evidence it by successfully negotiating and signing a collaboration agreement. To assess competencies related to technology and product development, students are required to further develop their project's deep technology venture idea for a full academic year. They are expected to apply intellectual property skills on the idea, as well as design and carry out real-life technology verification studies through prototyping and writing up of results. To assess competencies related to communication and substantiation of value, students are required to establish contact by phone with a minimum of five real-life potential customers and meet two of them in physical meetings. They are required to communicate the value proposition of their venture through real-life social media marketing channels. They also must meet and discuss with two sales experts in the industry of their venture, documenting key industry-specific sales techniques.

## Discussion

Findings show that all of the five assessment methods that literature stipulated to be of relevance to experiential education are extensively used at CSE. A number of interconnected aspects between these methods in use

can be observed. For example, self-reflections around constructively aligned performance tasks are being collected through an innovative e-assessment tool. External stakeholders also conduct summative performance assessments, triggering both peer assessment and self-assessment within the class. The discussion section aims to draw on such interconnections in order to make explicit some generalizable patterns of potential relevance beyond the CSE case.

## Assessment of Value Versus Assessment of Learning

The findings from the CSE case illustrate the key role that the underpinning ‘learning-through-creating-value-for-others’ perspective plays for making the intricate web of varying assessment practices hold together. When engaging external stakeholders in assessment work, it is not assessment of *learning* that is outsourced to these external stakeholders. It is rather an assessment of the *value* that students have (or have not) created, as viewed from the perspective of the presumably qualified external stakeholder. The value proposition put forward by the students is assessed professionally by external stakeholders over the phone, through written materials, in physical meetings, in pitch sessions and through other means as outlined in the findings section. The external stakeholders’ motivation for engaging with CSE students is grounded in their field of expertise and in the mutual value that can come out of it, rather than in a capacity to assess student learning. Assessing and appreciating the value created by the students is in fact what makes the stakeholders want to be engaged. However, it may not always be clear to students that the external stakeholders are making such a distinction, and this is a critical challenge for faculty to take into consideration.

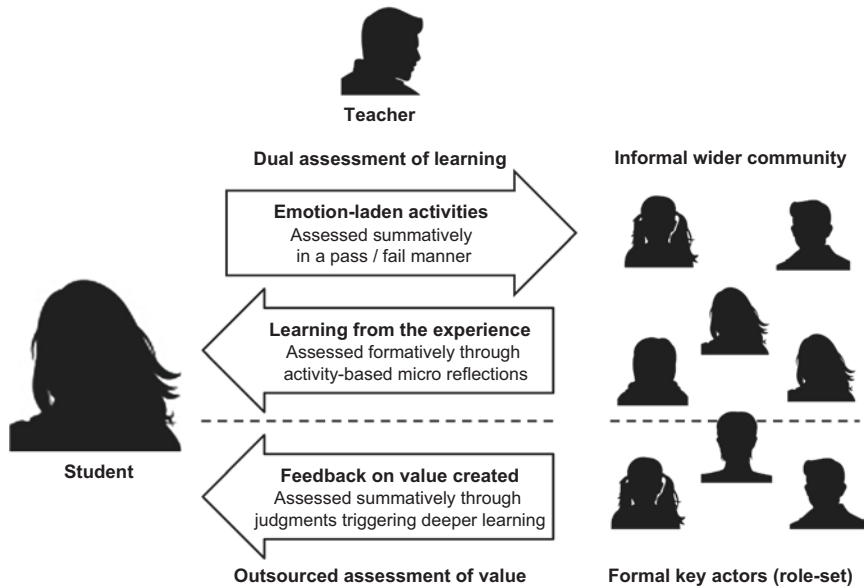
In a similar fashion, faculty does not engage in assessing the value that students create. Teachers instead focus on assessing student learning from value creation activities through performance assessment, reflective assessment, peer/self-assessment and e-assessment as described in the findings section. Assessing the value of a core technology, service or product in the shape of a venture’s commercial value proposition is not something that educators can or should effectively assess. It is rather actors in the entrepreneurial ecosystem and in the marketplace that should determine the

viability of a venture's value proposition, such as business coaches, board members, investors, industry experts, potential customers and others. Such a set of key actors has been labelled a 'role set' and plays a fundamental role in the CSE case for developing students' entrepreneurial competencies and identity (Williams Middleton 2013).

The assessment work that such a role set contributes with can thus not be used for grading students or for awarding formal qualifications, since the purpose of education is not venture success or even value creation in general, but rather student learning. It would thus not make sense to pass those students that built a successful venture and fail those students that terminated their venture. Assessment of value rather serves as a powerful source of feedback and resulting strong increase in motivation for the students. Previous research has established strong links between motivation and learning (Boekaerts 2010). Such assessment could then be classified as formative assessment. Even if it is about summatively assessing the value proposition that has been put forward by the students, the reason teachers include it is because it deepens student learning. Its delivery forms are often made up of summarized oral judgements and awards towards the end of a tandem learning and value creation process. Such judgements often drive the learning process forward more efficiently than grades.

## Synthesizing into a Coherent Assessment Model

The assessment work distribution between the different parties involved in CSE has been modelled in Fig. 2.1. In line with constructive alignment principles, assessment is focused on those activities that students need to do in order to learn entrepreneurial competencies. Drawing on the key role that emotions play for learning (Boekaerts 2010; Dirkx 2001; Postle 1993), emphasis is put on those activities that are particularly emotion-laden. This frequently activates both deep learning and powerful feedback in the shape of assessment conducted by external stakeholders. A carefully selected set of emotional activities are summatively assessed by the teacher in a pass/fail manner, as described in the findings section. Reflections around these activities represent a mandatory formative assessment component, where



**Fig. 2.1** A proposed model for assessment in experiential education containing dual assessment of learning and outsourced assessment of value

the aim is to get students to reflect on what they have learned from the emotionally charged activities and relate this to relevant theories and literature. This then hopefully generates self-directed learners capable of independent and socially responsible thinking and acting. Students also learn how to translate relevant theories and reflections from practice into a personalized theory of what works for them (Williams Middleton and Donnellon 2014).

A more general proposition can now be generated from the CSE case; experiential education teachers should engage in a dual assessment process where emotion-laden activities are summatively assessed in a pass/fail manner and where the resulting deep learning is formatively assessed through mandatory reflections. Assessment of value created by the students should be outsourced to external stakeholders. Some of these stakeholders can be formalized into a carefully designed and formally contracted role set, and others could be part of a wider community that students interact with based on situational fit.

## A New Assessment Method: Capturing Learning from Emotion-Laden Activities

The CSE case contains a number of different kinds of emotion-laden activities that are assessed in a dual-process manner. Students learn by performing and reflecting on a number of mandatory activities such as external stakeholder interaction, extensive teamwork, applying theory in practice, managing people, creating value for others, managing uncertainty, presenting to others and overcoming competence gaps (Lackéus 2014). Using summative assessment in a pass/fail manner to direct students to experience and reflect upon such emotion-laden activities is here posited to represent a new assessment method: emotion-laden activity-based assessment. To the authors' knowledge, this has not previously been described in literature on assessment in experiential education. This is argued to represent a new way to design and deliver experiential education. Drawing from the constructive alignment principles, educators can ask themselves the following key question: 'What emotion-laden activities do our students need to *do* in order to *learn* the competencies we want them to learn?' When a list of such key activities has been generated, they can be mandated to students and assessed in a dual manner as shown in Fig. 2.1.

The CSE case shows that this novel assessment method needs to be applied with certain care. Information to students about the full implications of performing emotion-laden activities may need to be carefully thought through. Students could perceive in hindsight that faculty had access to information that could have prevented a failure or a particularly emotional experience. Furthermore, not all students will be in the same stage at the same time. This can put a strain on peer learning as circumstances will make some students learn important lessons before others. As these others have not yet had the emotionally charged experience, they cannot always appreciate the learning that their peer students have gained. Capturing the learning from emotion-laden activities thus puts new requirements on educators in terms of sequencing the learning experience and communicating with students both before and after the occurrence of emotional learning events.

## Leveraging on a Third Learning Space: Informal and Hybrid Learning

As a way to transcend problematic dichotomies such as theory versus practice or campus-based versus work-based learning, the term ‘third space’ has been proposed in order to conceptualize a hybrid learning space where different kinds of learning are brought together (Gutiérrez et al. 1999; Zeichner 2010). Third space-based learning can thus refer to an amalgam between formal education and non-formal learning. CSE is an example in point of such a third space-based learning environment. While it can be argued that hybridized informal learning almost always occurs to a certain extent, the CSE case shows how assessment configured in line with Fig. 2.1 can contribute to making such a third space of learning more explicit. Given that assessment and learning are largely inseparable (Higgs 2014), assessment can play a key role in leveraging third space-based learning. Assessment design could strengthen the impact of third space learning by forcing students to both experience and get the most out of emotionally charged learning experiences. Examples of such formalized assessment practice at CSE include structures for group development talks, dedicated office space, the e-assessment platform LoopMe and mandatory shareholder agreements. A carefully designed ‘third space’ assessment strategy composed of such contracts, rules of engagement, boundaries, norms and physical as well as virtual reflective spaces could thus be critical for advancing experiential education.

## Implications

Both educators and scholars in experiential education can now consider adhering to the separation proposed here between assessing learning and assessing value. This could help clarify the ‘rules of engagement’ between key actors collaborating to deliver experiential education. It could also facilitate understanding of varying motivations of different key actors, helping in the articulation of collaboration agreements and in the resolution of conflicts. The proposed assessment model could be considered by



educators who are in need for guidance when designing assessment structures for experiential education. It could also serve as inspiration for future scholarly work in assessment of experiential education. Educators and scholars now need to test the proposition put forward here that the assessment model in Fig. 2.1 is useful beyond VCPs.

Given the stipulated key importance of external stakeholders having something to value when engaging in experiential education such as CSE, a stronger emphasis on students learning through creating value for others can be viewed as a necessary focus for experiential educators, both within entrepreneurship and in other subject areas. If experiential educators are to succeed in engaging external stakeholders in their courses and programmes, they will arguably need to let their students create some kind of value for such stakeholders that can be appreciated and assessed. The value does not need to be economic as in the CSE case, but can be social, relational, emotional, ecological or in line with any other valuation framework (cf. Stark 2011). The new assessment method articulated here, leaning on emotion-laden activities, can also be applied in such endeavours. Applications of these propositions in practice, beyond the CSE case where the methods were articulated, could then be of interest to study for scholars from a number of different scholarly fields.

The model in Fig. 2.1 implies that assessing activity is not enough in experiential education. According to the model, each of the key emotion-laden activities needs to be coupled with timely reflection in order for students to learn the competencies educators are aiming towards. Emotion-laden activities also need to be specified in distilled ways and included in a task-based micro-level assessment regime, preferably managed through an e-assessment tool such as LoopMe. Experiential education scholars also need to build a scientific base around which emotion-laden activities are the most relevant ones in any given kind of experiential education (Lackéus 2017a). Scholars cannot settle with assuming that those key emotion-laden activities that are used at CSE are apposite also for other subject areas.

Given that this chapter has articulated a number of ways in which experiential education can be assessed and managed more clearly and easily, it is the hope of the authors that future work along the implications articulated here could lead to experiential education being more common

in educational institutions than at present. The strong impact on student learning and identity construction seen in the CSE case indeed makes developing such ‘third space’ learning environments a worthwhile endeavour.

## References

- Adams, N. (2016). *Does an undergraduate venture creation programme in a University Achieve its Objectives?* Paper presented at the Proceedings of The 11th European Conference on Innovation and Entrepreneurship 15–16 September 2016.
- Åstebro, T., Bazzazian, N., & Braguinsky, S. (2012). Startups by recent university graduates and their faculty: Implications for university entrepreneurship policy. *Research Policy*, 41(4), 663–677. <https://doi.org/10.1016/j.respol.2012.01.004>.
- Bacigalupo, M., Kampylis, P., McCallum, E., & Punie, Y. (2016). *Promoting the entrepreneurship competence of young adults in Europe: Towards a self-assessment tool*. Paper presented at the Proceedings of ICERI2016 Conference, 14–16 November 2016, Seville, Spain.
- Barr, S. H., Baker, T., & Markham, S. K. (2009). Bridging the valley of death: Lessons learned from 14 years of commercialization of technology education. *Academy of Management Learning & Education*, 8(3), 370–388.
- Berggren, E. (2011). The entrepreneurial university’s influence on commercialisation of academic research – The illustrative case of Chalmers University of Technology. *International Journal of Entrepreneurship and Small Business*, 12(4), 429–444.
- Biggs, J. B., & Tang, C. (2011). *Teaching for quality learning at university: What the student does* (4th ed.). Maidenhead: McGraw-Hill Education.
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5(1), 7–74.
- Blenker, P., Frederiksen, S. H., Korsgaard, S., Muller, S., Neergaard, H., & Thrane, C. (2012). Entrepreneurship as everyday practice: Towards a personalized pedagogy of enterprise education. *Industry and Higher Education*, 26(6), 417–430.
- Boekaerts, M. (2010). The crucial role of motivation and emotion in classroom learning. In H. Dumont, D. Istance, & F. Benavides (Eds.), *The nature of learning* (pp. 91–111). Paris: OECD Publishing.

- Bond, J. B., Evans, L., & Ellis, A. K. (2011). Reflective assessment. *Principal Leadership*, 11(6), 32–34.
- Boyle, A., & Hutchison, D. (2009). Sophisticated tasks in e-assessment: What are they and what are their benefits? *Assessment & Evaluation in Higher Education*, 34(3), 305–319.
- Bozward, D., & Rogers-Draycott, M. C. (2017). *Value creation programmes: Lessons from an early stage implementation*. In ISBE Conference 2017, 8–9 November 2017, Belfast.
- Cope, J. (2005). Toward a dynamic learning perspective of entrepreneurship. *Entrepreneurship Theory and Practice*, 29(4), 373–397. <https://doi.org/10.1111/j.1540-6520.2005.00090.x>.
- Darling-Hammond, L. (1994). Performance-based assessment and educational equity. *Harvard Educational Review*, 64(1), 5–31.
- Deacon, J., & Harris, J. (2011). A longitudinal reflection of blended/reflexive enterprise and entrepreneurial education. *Reflective Practice*, 12(5), 599–613.
- Dirkx, J. M. (2001). The power of feelings: Emotion, imagination, and the construction of meaning in adult learning. *New Directions for Adult and Continuing Education*, 2001(89), 63–72.
- Dochy, F., Segers, M., & Sluijsmans, D. (1999). The use of self-, peer and co-assessment in higher education: A review. *Studies in Higher Education*, 24(3), 331–350.
- Eisenhardt, K. M., & Graebner, M. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25–32.
- Ellis, A. K. (2001). *Teaching, learning, and assessment together: The reflective classroom*. New York: Eye on Education.
- Eyler, J. (2009). The power of experiential education. *Liberal Education*, 95(4), 24–31.
- Ferns, S., & Comfort, J. (2014). Eportfolios as evidence of standards and outcomes in work-integrated learning. *Asia-Pacific Journal of Cooperative Education*, 15(3), 269–280.
- Ferns, S., & Moore, K. (2012). Assessing student outcomes in fieldwork placements: An overview of current practice. *Asia-Pacific Journal of Cooperative Education*, 13(4), 207–224.
- Finkle, T. A., & Deeds, D. (2001). Trends in the market for entrepreneurship faculty, 1989–1998. *Journal of Business Venturing*, 16(6), 613–630.
- Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. London: Further Education Unit Google Scholar.

- Gosen, J., & Washbush, J. (2004). A review of scholarship on assessing experiential learning effectiveness. *Simulation & Gaming*, 35(2), 270–293.
- Gutiérrez, K. D., Baquedano-López, P., & Tejeda, C. (1999). Rethinking diversity: Hybridity and hybrid language practices in the third space. *Mind, Culture, and Activity*, 6(4), 286–303.
- Haines, G. H. (1988). The Ombudsman: Teaching entrepreneurship. *Interfaces*, 18(5), 23–30.
- Henry, C. (2015). Entrepreneurship education evaluation: Revisiting storey to hunt for the heffalump. *Education+ Training*, 57(8/9), 816–833.
- Henry, C., Hill, F., & Leitch, C. (2005a). Entrepreneurship education and training: Can entrepreneurship be taught? Part I. *Education + Training*, 47(2), 98–111.
- Henry, C., Hill, F., & Leitch, C. (2005b). Entrepreneurship education and training: Can entrepreneurship be taught? Part II. *Education + Training*, 47(3), 158–169.
- Higgs, J. (2014). Assessing the immeasurables of practice. *Asia-Pacific Journal of Cooperative Education*, 15(3), 253–267.
- Human, S. E., Clark, T., & Baucus, M. S. (2005). Student online self-assessment: Structuring individual-level learning in a new venture creation course. *Journal of Management Education*, 29(1), 111–134.
- Isaacs, T., Zara, C., Herbert, G., Coombs, S. J., & Smith, C. (2013). *Key concepts in educational assessment*. London: Sage Publications.
- Jarvis, P. (2002). Practice-based and problem-based learning. In P. Jarvis (Ed.), *The theory and practice of teaching* (pp. 123–131). London: Kogan Page Ltd.
- Jarvis, P. (2006). *Towards a comprehensive theory of human learning* (Vol. 1). New York: Routledge.
- Johannisson, B. (2016). Limits to and prospects of entrepreneurship education in the academic context. *Entrepreneurship & Regional Development*, 28(5/6), 403–423.
- Jones, C. (2006). Enterprise education: Revisiting Whitehead to satisfy Gibbs. *Education+ Training*, 48(5), 356–367.
- Jones, C., & English, J. (2004). A contemporary approach to entrepreneurship education. *Education + Training*, 46(8/9), 416–423.
- Jordan, S., & Mitchell, T. (2009). e-Assessment for learning? The potential of short-answer free-text questions with tailored feedback. *British Journal of Educational Technology*, 40(2), 371–385.
- Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management learning and education. *Academy of Management Learning & Education*, 1(2), 137–149.

- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs: Prentice Hall.
- Krueger, N. F. (2009). The microfoundations of entrepreneurial learning and... education: The experiential essence of entrepreneurial cognition. In *Handbook of university-wide entrepreneurship education* (pp. 35–59). Cheltenham: Edward Elgar Publishing.
- Kuratko, D. F. (2005). The emergence of entrepreneurship education: Development, trends, and challenges. *Entrepreneurship Theory and Practice*, 29(5), 577–597.
- Lackéus, M. (2013). *Developing entrepreneurial competencies – An action-based approach and classification in education* (Licentiate Thesis). Gothenburg: Chalmers University of Technology.
- Lackéus, M. (2014). An emotion based approach to assessing entrepreneurial education. *International Journal of Management Education*, 12(3), 374–396.
- Lackéus, M. (2016). *Value creation as educational practice – Towards a new educational philosophy grounded in entrepreneurship?* (PhD Kappa). Gothenburg: Chalmers University of Technology.
- Lackéus, M. (2017a). *Can scientific social media disrupt entrepreneurship research?* Paper presented at the Internal working paper Chalmers University of Technology, Sweden.
- Lackéus, M. (2017b). Does entrepreneurial education trigger more or less neo-liberalism in education? *Education + Training*, 59(6), 635–650.
- Lackéus, M., & Williams Middleton, K. (2015). Venture creation programs: Bridging entrepreneurship education and technology transfer. *Education and Training*, 57(1), 48–73.
- Lackéus, M., Lundqvist, M., & Williams Middleton, K. (2016). Bridging the traditional – Progressive education rift through entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 22(6), 777–803.
- Lans, T., Biemans, H., & Baggen, Y. (2015). *Opportunity competence contributes to successfully leveraging ideas for entrepreneurship and innovativeness in enterprises*. Friedrichshafen: LLLight'in'Europe.
- Lindholm Dahlstrand, Å., & Berggren, E. (2010). Linking innovation and entrepreneurship in higher education: A study of Swedish schools of entrepreneurship. In R. Oakey, A. Groen, G. Cook, & P. van der Sijde (Eds.), *New technology based firms in the new millennium – Funding: An enduring problem* (Vol. 8, pp. 35–50). Bingley: Emerald Group Publishing Ltd.
- Lockyer, J., & Adams, N. (2014). *Venture creation programmes: Causation or effectuation?* Paper presented at the European Conference on Innovation and Entrepreneurship.

- Lundqvist, M., & Williams Middleton, K. (2008). Sustainable wealth creation beyond shareholder value. In C. Wankel & J. A. F. Stoner (Eds.), *Innovative approaches to global sustainability* (pp. 39–62). New York: Palgrave Macmillan.
- Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211–224.
- McNamara, J. (2013). The challenge of assessing professional competence in work integrated learning. *Assessment & Evaluation in Higher Education*, 38(2), 183–197.
- McQueen, D. H., & Wallmark, J. T. (1982). Spin-off companies from Chalmers University of Technology. *Technovation*, 1(4), 305–315.
- Meyer, A. D., Aten, K., Krause, A. J., & Metzger, M. L. (2011). Creating a university technology commercialisation programme: Confronting conflicts between learning, discovery and commercialisation goals. *International Journal of Entrepreneurship and Innovation Management*, 13(2), 179–198.
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.
- Minniti, M., & Bygrave, W. D. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory and Practice*, 25(3), 5–16.
- Molee, L. M., Henry, M. E., Sessa, V. I., & McKinney-Prupis, E. R. (2011). Assessing learning in service-learning courses through critical reflection. *Journal of Experiential Education*, 33(3), 239–257.
- Moon, J. A. (2004). *A handbook of reflective and experiential learning: Theory and practice*. London: Psychology Press.
- Morland, L., & Thompson, J. L. (2016). New venture creation as a learning agenda: Experiences, reflections and implications from running a venture creation programme. In M. H. Morris & E. Liguori (Eds.), *Annals of Entrepreneurship Education and Pedagogy–2016* (pp. 200–225). Cheltenham: Edward Elgar Publishing.
- Neck, H. M., Greene, P. G., & Brush, C. G. (2014). *Teaching entrepreneurship: A practice-based approach*. Cheltenham: Edward Elgar Publishing.
- Ollila, S., & Williams Middleton, K. (2011). The venture creation approach: Integrating entrepreneurial education and incubation at the university. *International Journal of Entrepreneurship and Innovation Management*, 13(2), 161–178.
- Pittaway, L., & Edwards, C. (2012). Assessment: Examining practice in entrepreneurship education. *Education+ Training*, 54(8/9), 778–800.
- Pittaway, L., Hannon, P., Gibb, A., & Thompson, J. (2009). Assessment practice in enterprise education. *International Journal of Entrepreneurial Behaviour & Research*, 15(1), 71–93.

- Politis, D. (2005). The process of entrepreneurial learning: A conceptual framework. *Entrepreneurship Theory and Practice*, 29(4), 399–424. <https://doi.org/10.1111/j.1540-6520.2005.00091.x>.
- Postle, D. (1993). Putting the heart back into learning. In D. Boud, R. Cohen, & D. Walker (Eds.), *Using experience for learning* (pp. 33–45). London: Society for Research into Higher Education and Open University Press.
- Rasmussen, E., & Sørheim, R. (2006). Action-based entrepreneurship education. *Technovation*, 26(2), 185–194.
- Rasmussen, E., Moen, Ø., & Gulbrandsen, M. (2006). Initiatives to promote commercialization of university knowledge. *Technovation*, 26, 518–533.
- Roberts, J. W. (2015). *Experiential education in the college context: What it is, how it works, and why it matters*. New York: Routledge.
- Ruskovaara, E., & Pihkala, T. (2016). *Review, comparison and evaluation of seven assessment tools*. European Entrepreneurship Education NETwork.
- Ruskovaara, E., Pihkala, T., Seikkula-Leino, J., & Rytkölä, T. (2015). Creating a measurement tool for entrepreneurship education: A participatory development approach. In A. Fayolle, P. Kyrö, & F. Liñan (Eds.), *Developing, shaping and growing entrepreneurship* (pp. 40–57). Cheltenham: Edward Elgar.
- Schein, E. H. (1993). Legitimizing clinical research in the study of organizational culture. *Journal of Counseling and Development*, 71(6), 703–708.
- Stark, D. (2011). *The sense of dissonance: Accounts of worth in economic life*. Princeton: Princeton University Press.
- Stödtberg, U. (2012). A research review of e-assessment. *Assessment & Evaluation in Higher Education*, 37(5), 591–604.
- Streeter, D. H., Kher, R., & Jaquette, J. P., Jr. (2011). University-wide trends in entrepreneurship education and the rankings: A dilemma. *Journal of Entrepreneurship Education*, 14, 75.
- Thursby, M. C., Fuller, A. W., & Thursby, J. (2009). An integrated approach to educating professionals for careers in innovation. *Academy of Management Learning & Education*, 8(3), 389–405.
- Warhuus, J. P., & Basaiawmoit, R. V. (2014). Entrepreneurship education at Nordic technical higher education institutions: Comparing and contrasting program designs and content. *The International Journal of Management Education*, 12(3), 317–332.
- Williams Middleton, K. (2013). Becoming entrepreneurial: Gaining legitimacy in the nascent phase. *International Journal of Entrepreneurial Behaviour & Research*, 19(4), 404–424. <https://doi.org/10.1108/IJEBR-04-2012-0049>.

- Williams Middleton, K., & Donnellon, A. (2014). Personalizing entrepreneurial learning: A pedagogy for facilitating the know why. *Entrepreneurship Research Journal*, 4(2), 167–204.
- Yin, R. K. (2008). *Case study research: Design and methods*. London: Sage Publications.
- Yorke, M. (2011). Work-engaged learning: Towards a paradigm shift in assessment. *Quality in Higher Education*, 17(1), 117–130.
- Zeichner, K. (2010). Rethinking the connections between campus courses and field experiences in college-and university-based teacher education. *Journal of teacher education*, 61(1–2), 89–99.